

23 days. The most important frosts were those of the closing 4 days of the month, when the formation was heavy or killing in all except extreme southeastern sections. Special attention was given to the warnings for Nebraska, Iowa, and Illinois, owing to the critical condition of the corn crop in respect to seed; and it is known that because of the warnings much seed corn was saved. Then, too, the warnings for the cranberry interests in Wisconsin served a useful purpose, as indicated in several letters that have come to hand. At the close of the month warnings were no longer being issued for most of the Northern Rocky Mountain region, the growing season there having terminated.

*Storm warnings.*—On the Great Lakes, particularly on the Lower Lakes, the month was more inclement than the average September. Storm warnings were issued on six days, and small-craft warnings on five other days.

No warnings of any character were issued until the 12th, although disturbances on the 2d and 5th caused gales of brief duration over central Lake Erie, and on the 8th–9th over part of the eastern Lake region, including extreme eastern Lake Superior. In some instances the winds referred to occurred in connection with thunderstorms.

On the 12th either southwest or northwest warnings were issued for practically all the Great Lakes, in connection with a disturbance over northern Lake Michigan, but the warnings were lowered in the evening, when the force of the storm appeared to have been spent. Generally speaking, the warnings were well verified.

The remainder of the second decade was mostly quiet, but on the morning of the 21st, with a disturbance of rapidly increasing energy central over southern Minnesota, warnings were issued for the Upper Lakes, and 12 hours later for the Lower Lakes. The center of the storm moved rapidly north-northeastward and later northeastward, and by the evening of the 22d had practically disappeared from the field of observation. The warnings issued in this connection were for the most part verified.

On the morning of the 26th a disturbance in the form of a trough and of some depth covered the Plains States, and at the same time a large high pressure area overlay the northeast, thus creating a marked gradient. Accordingly, warnings were issued for most of the Upper Lakes section. On the following morning, with the storm then decreasing in strength, small-craft warnings were advised for all the Great Lakes, except Lake Ontario.

Small-craft warnings were advised for the Lower Lakes on the 29th, when a disturbance of increasing energy covered the Middle and South Atlantic States, and indicated an almost due northward movement. As a result of afternoon special observations northeast storm warnings were issued for Lake Ontario, and at night these were extended westward on Lake Erie to the Cleveland district. The only verifying winds within the 36-hour period occurred at Cleveland, although 60 miles was reached at Buffalo, N. Y., on October 1.

The fire-weather forecasts for western Montana were discontinued for the season on the 20th, and those for the benefit of fruit interests in Door County, Wis., and southwestern Michigan, on the 30th.—*C. A. Donnel.*

#### NEW ORLEANS FORECAST DISTRICT

No storm occurred on the west Gulf coast during the month and no storm warnings were issued from New Orleans. Small-craft warnings were displayed on part

of the Texas coast on the 12th, and all the Texas coast on the 28th.

Storm warnings were issued from the Central Office for New Orleans and Burrwood on the 13th and 14th, and for Burrwood on the 29th, but no storm verifying velocities occurred.

Frost warnings were issued on the 27th for the northwestern portion of the district, and on the 28th and 29th for the northern portion, and light frost occurred in scattered localities on the 28th, 29th, and 30th. No frost warnings were issued on the 20th, because at the rate the high-pressure area was traveling it would have been too far east by October 1 to give frost in this district; but it dropped southward with a slower eastward movement and light frost occurred in scattered localities in eastern Arkansas and northern Louisiana.—*I. M. Cline.*

#### DENVER FORECAST DISTRICT

Areas of low atmospheric pressure, followed by areas of high, crossed the district three times during the month, causing sharp falls in temperature, while at the beginning of the month another temperature and pressure transition was in progress. Warnings of frost were necessary and were issued for various appropriate portions of the district on the 1st, the 11th to 13th, the 18th to 22d, and the 25th to 29th, inclusive. Warnings of freezing or lower temperatures were included on the 20th for southwestern Colorado, northeastern Arizona, southern and extreme northwestern Utah, on the 21st for southwestern and exposed places in northern and eastern Colorado, northwestern New Mexico, northeastern Arizona, and exposed places in Utah; on the 26th for western Colorado, northwestern New Mexico, northeastern Arizona, and Utah; on the 27th for northwestern New Mexico and northeastern Arizona, and for exposed places in Colorado and Utah; on the 28th for southwestern Colorado and northwestern New Mexico, and on the 29th for exposed places in southwestern Colorado. On mornings subsequent to those on which the foregoing warnings were issued, temperatures were experienced far enough below freezing to kill green crops in the colder sections, while much damage was done to crops in the milder sections by temperatures of freezing and below.

As a result of the unusually dry summer a high fire hazard prevailed during a considerable portion of the month, consequently daily advice was published relative to the hazard in the forested districts, particularly for Colorado. The rains from the 9th to the 11th were especially beneficial in reducing the hazard for a time. Special warnings were issued on the 19th and 25th for southern Utah, Arizona, and New Mexico for increasing westerly winds which would add to the danger, due to the influence of low-pressure areas moving over the sections named without causing appreciable precipitation. The increase in the wind subsequent to the warning of the 25th was most pronounced, velocities of 46 miles an hour from a westerly direction being reported from the Weather Bureau stations at Modena, Utah, and Albuquerque, N. Mex.

Owing to the extremely low water in the lower Colorado River and the resultant heavy losses in the adjacent irrigation districts, numerous requests were answered relative to the probable rise that would be caused by the heavy rains which fell in the middle and upper drainage areas from the 9th to the 11th.—*Lawrence C. Fisher.*